IN THE CLAIMS:

Please cancel claim 6 without prejudice, add new claim 32, and amend the claims as follows:

1. (Currently Amended) A method for pre-cleaning apertures on a substrate, the method comprising:

disposing the substrate on a substrate support member in a process chamber;

cooling the substrate ~~at least~~ to a temperature of 100 degrees Celsius or less; and

exposing the substrate to a pre-clean process comprising forming a plasma from a gas mixture consisting of a non-reactive gas and a reactive gas selected from the group consisting of fluorine containing gases and hydrogen.

2. (Currently Amended) The method of claim 1, ~~wherein the step of disposing the substrate on the substrate support member~~ further ~~comprises:~~ comprising electrostatically chucking the substrate to the substrate support member.

3. (Currently Amended) The method of claim 1, wherein the ~~step of~~ cooling the substrate ~~further~~ comprises:

flowing a gas through the substrate support member to an area between the substrate support member and the substrate.

4. (Currently Amended) The method of claim 1, wherein the ~~step of~~ cooling the substrate ~~further~~ comprises:

transferring heat from the substrate through a thermoelectric device.

5. (Currently Amended) The method of claim 1, wherein the ~~step of~~ cooling the substrate ~~further~~ comprises:

transferring heat from the substrate through the substrate support member to a heat transfer fluid.

6. (Canceled)

7. (Currently Amended) The method of claim 1, wherein the pre-clean process further comprises:

~~forming a plasma from a gas comprising argon, nitrogen or helium; and~~

etching native copper oxide from the ~~at least partially exposed layer~~ substrate.

8. (Original) The method of claim 7, wherein the pre-clean process further comprises:

inductively coupling about 1 to about 1000 Watts to the plasma; and

biasing a substrate support with less than about 300 Watts.

9. (Currently Amended) The method of claim 7, wherein the pre-clean process further comprises:

~~flowing a reactive gas into the chamber to reduce~~ reducing native oxides or ~~react and remove~~ reacting and removing photoresist residue and contaminants.

10. (Currently Amended) A method for pre-cleaning apertures on a substrate, the method comprising:

disposing the substrate on a substrate support member in a process chamber;

electrostatically chucking the substrate to the substrate support member;

cooling the substrate to less than about 100 degrees Celsius; and

exposing the substrate a pre-clean process comprising a plasma formed from a gas ~~comprising argon~~ mixture consisting of a non-reactive gas.

11. (Original) The method of claim 10, wherein the pre-clean process further comprises:

inductively coupling about 1 to about 1000 Watts to the plasma;

biasing a substrate support with less than about 300 Watts; and

regulating the chamber pressure between about 0.5 to about 100 mTorr.

12. (Original) A method for pre-cleaning apertures on a substrate, the method comprising:

cooling the substrate to less than about 100 degrees Celsius;

transferring the cooled substrate to a substrate support member disposed in a process chamber; and

exposing the substrate to a pre-clean process.

13. (Currently Amended) The method of claim 12, wherein the ~~step of~~ cooling the substrate ~~further~~ comprises:

cooling the substrate in a degas chamber.

14. (Currently Amended) The method of claim 12, wherein the ~~step of~~ cooling the substrate ~~further~~ comprises:

cooling the substrate in a cool-down chamber.

15. (Original) The method of claim 12, wherein the pre-clean process comprises:

etching native oxides disposed on the substrate while cooling the substrate to a temperature of between about -40 and about 75 degrees Celsius.

16. (Original) The method of claim 12, wherein the pre-clean process comprises:

forming a plasma from a gas comprising argon, nitrogen or helium.

17. (Currently Amended) The method of claim 12, wherein the pre-clean process ~~further~~ comprises:

flowing a reactive gas into the chamber to reduce native oxides or react and remove photoresist residue and contaminants.

18. (Currently Amended) A method for pre-cleaning apertures on a substrate, the method comprising:

disposing the substrate on a substrate support member in a process chamber;

exposing an at least partially exposed copper layer on the substrate to a pre-clean process while maintaining a substrate temperature of less than about 100 degrees Celsius; and

depositing a bulk layer of copper on the at least partially exposed copper layer.

19. (Currently Amended) A method for pre-cleaning apertures on a substrate having an at least partially exposed copper layer, the method comprising:

disposing the substrate on a substrate support member in a process chamber;

cooling the substrate ~~at least~~ to a temperature of 100 degrees Celsius or less;

exposing ~~an~~ the at least partially exposed copper layer to a pre-clean process; and

depositing a barrier layer on the at least partially exposed copper layer.

20. (Currently Amended) The method of claim 19, wherein the ~~step of~~ depositing the barrier layer ~~further~~ comprises:

depositing a layer of silicon carbide, titanium nitride, tungsten nitride or tantalum nitride.

21. (Currently Amended) The method of claim ~~19~~ 20, wherein the ~~step of depositing the barrier layer further comprises:~~

~~depositing a layer of silicon carbide, titanium nitride, tungsten nitride or tantalum nitride~~ pre-clean process comprises exposing the at least partially exposed copper layer to a plasma of a reactive gas selected from the group consisting of fluorine containing gases and hydrogen.

22. (Currently Amended) A method for pre-cleaning apertures on a substrate, the method comprising:

cooling the substrate ~~at least~~ to a temperature of 100 degrees Celsius or less in a first chamber;

transferring the substrate to a second chamber; and

pre-cleaning an at least partially exposed layer in the second chamber while maintaining a substrate temperature of 100 degrees Celsius or less.

23. (Currently Amended) The method of claim 22, wherein the ~~step of~~ pre-cleaning ~~further~~ comprises:

providing backside gas between the substrate and a substrate support member.

24. (Currently Amended) The method of claim 23, wherein the ~~step of~~ pre-cleaning further comprises:

electrostatically chucking the substrate and the substrate support member.

25. (Original) The method of claim 22 further comprising:

transferring the substrate to a third processing chamber; and

depositing a barrier layer on the at least partially exposed layer.

26. (Currently Amended) The method of claim ~~24~~ 25, wherein the step of depositing the barrier layer ~~further~~ comprises:

depositing a layer of silicon carbide, titanium nitride, tungsten nitride or tantalum nitride.

27. (Currently Amended) A method for pre-cleaning apertures on a substrate having vias containing at least partially exposed copper features, the method comprising:

disposing the substrate on a substrate support member within a process chamber maintained at a chamber pressure of between about .5 to about 100 mtorr;

cooling the substrate to ~~at least~~ a temperature of between about –40 to about 100 degrees Celsius by maintaining a gas between a surface of the substrate support and a facing surface of the substrate to transfer heat from the substrate to the support member; and

exposing the at least partially exposed copper features to a pre-clean process comprising a plasma formed from a gas comprising a non-reactive gas.

28. (Original) The method of claim 27, wherein the substrate is cooled to a temperature of between about –40 to about 75 degrees Celsius.

29. (Original) The method of claim 27, wherein the plasma etches the copper without causing copper agglomerations on via surfaces.

30. (Original) The method of claim 27, wherein the pre-clean process gas further includes a reactive gas.

31. (Original) The method of claim 27 further comprising:

depositing a barrier layer on the at least partially exposed and pre-cleaned copper features.

32. (New) The method of claim 1, wherein the non-reactive gas is selected from the group consisting of argon, nitrogen, and helium.